

## EVALUATION OF FOOD CONSUMPTION OF ADOLESCENTS PRACTITIONERS OF CANOEING OF THE NAUTICAL CENTER IN SÃO VICENTE / SP

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### Abstract

Adolescence is a period of life characterized by various physical and behavioral changes, which have direct influence on food consumption patterns. Because of these changes, there is an increase in nutritional needs. The adolescent athlete who adopts inappropriate feeding behaviors may have their performance and health impaired. This study aims to assess dietary intakes of adolescents practicing canoeing of the Nautical Center in São Vicente / SP. The sample consisted of 52 adolescents (78.85% male and 21,15% female) with socioeconomic vulnerability, which was measured BMI (WHO, 2006) and fat percentage (SLAUGHTER et al., 1988). In relation to food consumption, we applied a 24-hour dietary recall and a food frequency questionnaire adapted, based on the model proposed by VILLAR, 2001. We calculated energy intake, carbohydrates, lipids, protein, fiber, vitamin A, vitamin C, calcium and iron. The results were compared to WHO recommendations, 2003 (Report 916) and IOM (1997, 1998, 2000 and 2001). In relation to anthropometric, 21.16% of the practitioners were overweight and 36.53% had excess of body fat. About the consumption of food groups, we observed low intake of fruits and vegetables and high intake of fats and oils. 7.69% and 9.61% of examined, respectively, did not carry lunch and dinner. The average intake of kilocalories, fiber, vitamin A, vitamin C and calcium were below the recommendations. The average distribution of macronutrients were within the normal ranges. The iron was shown with consumption above the recommended values. The results indicate the need for adequate nutritional monitoring of this group, with implementation of food security actions in view of the importance of proper nutrition in this age group for disease prevention, health maintenance and performance.

**Key words:** adolescents; canoeing; food consumption.

### INTRODUCTION

It is widely recognized the importance of after-school activities, especially among the population of social risk as a way to keep children in school in addition to developing their skills in sports practices. The Projeto Nacional Segundo Tempo (National Project Second Round) is thus expanding and providing a public high school students the opportunity to, at the same time, share a play area, socialize, and yet, even absent the necessary skills to make it a professional athlete, share the pleasure of a healthy and enjoyable leisure.

In this spirit, the Secretaria de Esportes e Lazer (Department of Sports and Leisure), Sesor<sup>1</sup>, organ of the City of San Vicente / SP, has been deploying and implementing opportunities for

schoolchildren from public municipal schools to participate in various sporting groups.

The Sesor has as its main objective to create programs aimed at democratizing access to sports especially for children and adolescents enrolled in public schools. Through sports, the counter-round school, the Department intends to contribute to social inclusion, physical well-being, health promotion and intellectual development of children and adolescents who are in a situation of social vulnerability.

Among the sporting activities available for children, canoeing occupies a special place. Canoeing is a water sport, practiced with canoe or kayak, being an Olympic sport since 1936<sup>2</sup>. After revealing paddlers at international level, this sport discipline now has a great impact on the city. The increase in the number of young people practicing the sport is accompanied

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by personal and family hope of conquering fame and financial independence with the sport.

The proper nutrition is a prerequisite to realize these hopes. The athlete depends not only on weight control and proper body composition, but also on meeting the needs of vitamins and minerals and even on the way the meals are distributed on the day to improve your sports performance and achieve results allowing his entry as professional in national and international sports teams.

The objective of this study is to identify the nutritional status and adequacy of dietary intake of adolescents practicing canoeing in São Vicente.

## METHODS

It was conducted a cross-sectional study attended by 10-19 year-old youngsters, of both sexes, residents in the municipality of San Vicente/SP, enrolled in Escola de Canoagem do Centro Náutico (School of Canoeing of Nautical Center), instrument of Secretaria de Esportes da Prefeitura Municipal de São Vicente.

During data collection, among the 147 enrolled in the Nautical Center for canoeing activities 83 were teenagers and of these, 52 (63%) had the term of informed Consent (IC) completed and signed by their parents and formed the sample study.

Data collection was performed through a personal interview with socioeconomic and food consumption questionnaires as well as taking anthropometric measurements.

The Body Mass Index, BMI (weight / height <sup>2</sup>) was calculated from the measured weight and height by adopting the classification proposed by the World Health Organization (WHO, 2006)<sup>3</sup>. Already in 1996, Sichieri and Allan<sup>4</sup>, had set a nutritional status classification for Brazilian adolescents considering sex, age, weight, height and stage of sexual maturation. The same was not used because of the universality of the classification proposed by WHO.

The body composition was assessed by means of subcutaneous cellular tissue thickness. Three measurements were taken from triceps and subscapular skinfolds using Lange adipometer, and the techniques described in the technical manual by Lohman et al<sup>5</sup> being recorded their average value.

Dietary intake was assessed by dietary 24-hour recall and a food frequency questionnaire, FFQ adapted for the local food consumption practice by estimating the consumption by the Practical Guide to estimate consumption<sup>6</sup>.

To assess the energy consumption adequacy considering the level of physical activity (LPA), it was adopted the values listed below based on the WHO (2003)<sup>7</sup> and the reports of the Institute of Medicine<sup>8</sup>.

Boys	10-13 years old	2275 kcal
Boys	14-18 years old	3165 kcal
Boys	19 years old	3065 kcal
Girls	10-13 years old	2085 kcal
Girls	14-18 years old	2360 kcal

## RESULTS

It was found that among adolescents who participated in the study 77% were male. The observed decrease of members with increasing age suggests a decreased interest in sports, but this is not confirmed if we consider that only 56% of respondents in the Nautical Center are teenagers.

The studied population has in common a low socioeconomic status. Although 100% of households have access to garbage collection, four of them have no access to piped water and 13 families do not have sewage in their homes. The majority of families (81%) is included based on their monthly income below the poverty line, that is, income up to two minimum wages.

Table 1 presents the body mass index and the distribution of adolescents by fat content.

**Table 1:** Distribution of adolescents according to the Index Body Mass and Fat Index. Canoeing Practitioners, Nautical Center. São Vicente/SP, 2009

Category	IBM %	Fat Index %
Low	1,9	5,8
Eutrophic	76,9	57,7
High	21,2	36,5

It is interesting to note the discrepancy between BMI and body composition assessed by the fat content. The proportion of high levels of fat, 36.5% is almost double that presented by high BMI (21.2%). This difference suggests that the relationship between the two indicators of body adequacy do not maintain the expected balance between weight /height and fat cell. It is also worth noting that for both BMI and body fat, the most included under the high category are at the initial stage of the process while the higher fat is earlier manifested.

Table 2 shows the distribution of adolescents according to food consumption. It appears that none of the participants of the study eats six meals a day as recommended for those who play sports. Midway meals almost have no place in the paddlers' feeding routine.

Table 3 shows the frequency of food intake assessed by FFQ. It presents the food referred to as the usual daily diet of the sampled population and highlights the negligible presence

**Table 2:** Distribution of adolescents according to meals intake. Canoeing Practitioners, Nautical Center. São Vicente / SP, 2009

Meal	Have		Do not have	
	N <sup>r</sup>	%	N <sup>r</sup>	%
Breakfast	42	80,8	10	19,2
Collation	06	11,5	46	88,5
Lunch	48	92,3	04	7,7
Afternoon Snack	29	55,8	23	44,2
Dinner	47	90,4	05	9,6
Supper	07	13,5	45	86,5

**Table 3:** Percentage of food such as daily intake in FFQ. Canoeing Practitioners, Nautical Center. São Vicente/ SP, 2009

FOOD GROUP	FOOD	REFERENCES %
Diary products	milk, yogurt, cheese, cream cheese	52,9
Cereals	bread	88,5
	rice	96,0
	stuffed cookies	15,4
Leguminous	beans	84,6
Oils	added oils	100,0
Fats	margarine	78,9
Sweets	candies	100,0
Meat	bovine, pork, poultry, fish	28,8
Eggs	eggs	21,2
Embedded and viscera	sausages, animal innards and cold cuts	33,7
Sugar	adding sugar	96,2
Chocolates	chocolate/brigadeiro	5,8
Snacks	salties, cheesburger	17,3
Vegetables	canned (peas, corn)	15,4
Greens	lettuce, cabbage	5,8
Fruit	pineapple, orange, papaya, etc	7,7
Beverages	coffee	42,3
Soft-drinks	diet , normal, artificial juice	46,2

of food source of essential micronutrients. Greens, vegetables and fruits and even foods of animal origin are rarely reported, sources of high biological value proteins, were rarely reported.

Milk and dairy products are the most common among them, but even so, just over half of the sample reported their use routinely.

The adequacy of food consumption was assessed by 24-hour dietary recall (Table 4).

As can be seen the participation of fats in the daily diet of adolescents is very high at the expense of carbohydrates which would be expected considering the great frequency with which fried foods, snacks and other goodies were reported in the FFQ (Table 3). While the proteins have an appropriate share, possibly because of the insufficient presence of animal origin food, this adjustment is not accompanied by a desirable aminoacidic quality, especially in adolescence where growth occurs even with the development of characteristics of the adult.

Vitamins A and C, calcium, have poor consumption adequacy among boys, while only iron is appropriate. Among women, whose need for mineral is higher, the attendance of martial recommendation is far from being achieved.

However, if the diet is known, it becomes an important early indication of those needs and, therefore, enables to propose preventive interventions. It is accepted without argument that the population which uses the same food deficient in vitamin A, calcium and /or iron, is a population at risk for anemia, osteoporosis and / or hypovitaminosis A.

## DISCUSSION

As a strategic program of the Federal Government, Second Round aims to democratize access to the practice and culture of sports to promote the integral development of children,

**Table 4:** Adequacy percentage of energy consumption and selected nutrients. Canoeing Practitioners, Nautical Center. São Vicente/SP, 2009

	Boys (N = 20) 10-13 anos		Boys (N = 18) 14-18 anos		Boys (N = 2) 19 anos		Girls (N = 7) 10-13 anos		Girls (N = 5) 14-18 anos		Girls (N = 52)	
	Cons. Adeq	%	Cons. Adeq	%	Cons. Adeq	%	Cons. Adeq	%	Cons. Adeq	%	Cons. Adeq	%
Kcal/VET%	1842	81	1993	63	2268	74	1231	59	1888	80	1845	71
CHO	57	45	55	85	66	100	54	85	56	86	57	87
PTN	15	117	14	117	16	128	18	139	14	141	15	123
LIP	29	127	31	130	28	127	28	127	30	128	28	127
Vit.A (µg)	463	104	214	34	194	31	210	50	256	53	233	45
Vit.C (mg)	62	160	25	40	16	23	22	39	20	56	29	53
Ca (mg)	513	39	500	39	191	17	249	19	423	32	375	29
Fe (mg)*	11,5	100	13,26	121	16,95	154	8,60	57	11,51	77	12,37	100

\* the amount of iron is dependent on the state of adolescent development. For purposes of this study was undertaken to women 15mg and for boys 11mg

adolescents and youth as a factor in citizenship education and improving the quality of life, primarily of social vulnerability<sup>10</sup>. The sports program developed by the city of Sao Vicente to people at social risk have the same goals<sup>1</sup>. It is a unique opportunity for young people to find in a healthy environment for their physical and mental development, enjoyable and socializing activities. However, the transformation of this young amateur athlete in professional, which, especially for canoeing, began to represent a dream and a goal for his life, is hardly reached. In this sense, it is worth highlighting the decrease in demand for young people with increasing age (Table 1).

As portrayed by family income, the group of athletes dedicated to canoeing, consists of a highly deprived population. The majority of young people belongs to families that, by income, are included among those below the poverty line<sup>10</sup>. Within this framework, it can be inferred that eating safe and proper food can hardly happen. However, this quality food is essential not only for the young person be able to participate in sports activities with the best potential, but also to join a team, even amateur<sup>11</sup>.

The importance of adequate food is recognized by young people and their families. They understand that incorrect eating behaviors may generate failures even in the initiation of the chosen sport, discouraging the effort and dedication which are essential to their entry into competitions and transforming their status from amateur to professional. The family effort to ensure that these goals are realized is constant. In the search for their child's best sports performance, some families invest a portion of their meager salaries, often achieved through social income transfer programs, in ergogenic resources. Many of these resources are prescribed at parents' request, who believe this will increase the young's chance of winning.

Even with this effort, the food consumption described for paddlers is far from being adequate for the group as reflected both in body mass index, where is more than one fifth of the overweight/obese population, and in the Index Fat where the fat cell was found in one third of the sample (Table 1). For its adequacy to the reference to oils of addition, that is, the presence of frying in the daily diet, it is the only item present in 100% of the responses (Table 3) and consumption of lipids far exceeds the ideal for this macronutrient (Table 4). As described in the editorial of the first issue of the journal *Nutrire*, 2011<sup>12</sup>, the change in eating patterns cause changes that affect health such as the refined carbohydrates consumption, increased sugar and salt consumption, reduced fruits and vegetables consumption, all these factors present in the studied adolescents' diet (Tables 3 and 4).

The reported dietary habits favor the development of overweight and can be determinants of obesity and chronic non-communicable diseases in later life<sup>13</sup>.

Even identifying the importance of safe food, possibly for lack of knowledge of what is a healthy diet, eating habits (Tables 3 and 4) is far from allowing the nutritional adequacy achievement of the sportsman.

It is worth noting that the eating practice of the studied adolescents does not differ from that described for adolescents of other social groups. The preference of youth for greasy fries, soft drinks and other snacks poor in specific nutrients but rich in saturated fatty acids and high-calorie is described in all feeding studies of teenagers at home and at school.

As referred by Caroba and Silva<sup>14</sup>, and oriented by Fisberg<sup>15</sup>, although adolescence represents a privileged moment for health and nutrition interventions with a view to adopting healthy lifestyles and health promotion in later life, the media is responsible for transforming these food items in

wish fulfillment. The very public school cafeteria, or its surroundings, offer almost the only option this type of food product with a price lower than a nutritious snack, ending up being the adolescents' feeding option. They will get used to this type of "addictive" product, all with high levels of flavorings which should be avoided for the individuals' food security. The reduction of salt, sugar and / or lipids in industrialized foods has been the target of the Ministry of Health / ANVISA, in order to improve the eating habits of the Brazilian population and thereby reduce the risk of highly deleterious diseases such as diabetes, obesity, heart diseases among others.

The choice of micronutrients to be analyzed in this study to assess its suitability took into account two aspects: the first relates to the fact that both vitamins A and C and minerals Ca and Fe are present in small amount of food / group food and thus the low frequency in the presence of these items in the dietary feeding routine is indicative of nutritional risk. Dairy foods are the almost unique source of vitamin A and calcium, while fruits are the main source of vitamin C, being not very present in the adolescents' diet (Table 3). Since the iron, while having a wider distribution among the food groups is present in amount that allows the title of source, in beans and meat, the latter also poorly referred to on daily food consumption.

The second reason for this selection was the fact that these nutrients are responsible for nutritional problems in high frequency among developing populations: vitamin A deficiency, iron deficiency anemia and osteoporosis.

As for other public health problems, calcium deficiency, iron deficiency anemia and vitamin A deficiency, have their origin in a broad context, where the occurrences are linked not only to biological determinants, but also to socio-economic and cultural present conditions. There are multiple factors that contribute to their appearances. However, according to epidemiological studies, these nutritional deficiencies have in common being determined mainly by inadequate dietary intake.

It is worth noting the role of iron in the quality of life. Possibly because it is the nutrient whose deficiency occurs more frequently in the world, it is also one for which the knowledge either of the functions either of the serious consequences arising from it, is better studied. Determined in most cases by dietary mineral deficiency, the anemic status causes health problems in the individuals' productive capacity, in the women's reproductive capacity, in the cognitive development and immune response. Horton and Ross<sup>16</sup> emphasize the high overhead of iron deficiency in yield reduction, in maternal mortality, in prematurity, in birth low weight children, and especially in irreversible consequences on cognitive development that occur in childhood and are reflected in throughout life in significant loss of human resources bringing implications not only for personal development but also for developing nations. Machado et al<sup>17</sup>, analyzing the relationship

between iron deficiency and cognitive development, made a reflection on the overall development of individuals highlighting the importance of meeting the martial needs avoiding it to be a limiting factor for their social empowerment.

If teenagers' adequate food supply is a prerequisite for growth and development occurring in a harmonious and desirable way, it becomes an essential requirement especially for athletes who want to get to professionalism. The absence of intermediate meals and even the absence of the main meals within the entire sample population (Table 2), already allows to emphasize the difficulty of getting what nutrologists and nutritionists consider to be a healthy diet.

The low energy consumption adjustment described in Table 4 does not seem to be a nutritional problem for malnutrition. The Institute of Medicine<sup>8</sup> emphasizes that if the individual has an appropriate BMI he is eating the proper caloric intake for it, that is, although the average suitability of power consumption is below the recommended among all populational groups, those with adequate BMI should present eating errors not in consumed food quantity, but in the proportion that the macronutrients take part of the diet. Add to that the erroneous food distribution during the day, when intermediary meals are practically absent (Table 2).

Fisberg<sup>15</sup> coordinates the group PAPO - Programa de Atividades para o Paciente Obeso (Program of Activities for the Obese Patient) - <http://www.unifesp.br/dped/disciplinas/pedclin/adolesc/papo.htm>, which aims to design, implement and evaluate an interdisciplinary program that contributes to the reduction of weight excess and maintain the new weight in adolescent girls, through an interdisciplinary approach and attention leading to a long-term involvement with physical activity, proper nutrition and self-knowledge.

After birth, adolescence is the period of life when there is greater acceleration of growth and weight gain. This is when the question "what will you be when you grow up?" is replaced by self asking how can I reach my dreams, my goals?" "What I gotta do to be what I want to be?". In this period the prospects for the future begin. Studying, working, making friends, finally laying the foundations for the future, is part of the young people's aspirations.

How does Sescorp participate and contribute to that young man to become an independent, responsible and happy adult?

Certainly collaboration is enormous. Even though young people have not realized their desire to become a professional in a particular sport, they will certainly learn with the interaction with other people, facing many difficulties, especially due to their socio-economic situation, they learn to appreciate the effort to achieve a goal, to respect their peers, to share space and aspirations and certainly learn that the sport offers one every opportunity to become an organized and respectful citizen that can find joy and happiness in all achievements that they will certainly have in life.



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